



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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For: WATER VEHICLE PROPELLER)

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Clean Copy of the Claims as Amended 12/1/04

1. A propeller comprising an elongated shaft having a forward end and an opposite rearward end, a first elongated blade affixed to said elongated shaft, said first elongated blade having a first end closest to said forward end of said elongated shaft and an opposite second end closest to said rearward end of said elongated shaft, said first elongated blade extending outwardly from said elongated shaft to terminate outwardly in an elongated outer blade edge, said outer blade edge of said first elongated blade curving in one direction of rotation around said elongated shaft as said first elongated blade extends rearwardly from said first end thereof toward said second end thereof to curve in such direction of rotation less than one full rotation to thereupon terminate at said opposite second end of said first elongated blade, said outer blade edge being radially

spaced apart from said elongated shaft substantially the same distance from said first end to said second end.

2. A propeller comprising an elongated shaft having a forward end and an opposite rearward end, a first elongated helical blade affixed to said elongated shaft, said first elongated helical blade having an elongated outer blade edge radially spaced apart from said elongated shaft, a first blade end of said first elongated helical blade extending outwardly from said elongated shaft in one direction along a first blade edge thereof to terminate at said outer blade edge at one end of said outer blade edge and a spaced apart second blade end of said first elongated helical blade extending outwardly from said elongated shaft to terminate at said outer blade edge at the opposite end thereof, said first elongated helical blade extending along said elongated shaft on a helical path in a first direction of rotation around said elongated shaft from said first blade end to said second blade end, such rotation being less than one full rotation around said elongated shaft, said elongated shaft and said first elongated helical blade having a longitudinal dimension greater than the dimension between said elongated shaft and said outer blade edge of said first elongated helical blade radially spaced apart from said elongated shaft, said first blade end extending outwardly from said elongated shaft a distance that is substantially the same as the dimension between said elongated shaft and

said radially spaced apart outer blade edge of said first elongated helical blade .

3. A propeller as set forth in claim 2, wherein said second blade end extending outwardly from said elongated shaft extends outwardly therefrom in a different direction than said first blade end.

4. A propeller as set forth in claim 2, wherein said second blade end extending outwardly from said elongated shaft extends outwardly therefrom in the opposite direction from that in which said first blade end extends outwardly from said elongated shaft.

5. A propeller as set forth in claim 2, wherein said second blade end extending outwardly from said elongated shaft extends outwardly therefrom in substantially the same direction as said first blade end.

6. A propeller mechanism comprising a first propeller having a first elongated shaft having a forward end and an opposite rearward end, a first elongated helical blade affixed to said first elongated shaft, said first elongated helical blade having a first end closest to said forward end of said first elongated shaft and an opposite second end closest to said rearward end of said first elongated shaft, said first elongated helical blade extending radially outwardly from said first elongated shaft to terminate outwardly in a first elongated outer blade edge, said first outer blade edge of said first elongated helical blade

curving in a first direction of rotation around said first elongated shaft as said first elongated helical blade extends rearwardly from said first end thereof toward said second end thereof to curve in such direction of rotation less than one full rotation around said first elongated shaft to thereupon terminate at said opposite second end of said first elongated blade, a second propeller in side-by-side relationship to said first propeller, said second propeller having a second elongated shaft having a forward end and an opposite rearward end, a second elongated helical blade affixed to said second elongated shaft, said second elongated helical blade having a first end closest to said forward end of said second elongated shaft and an opposite second end closest to said rearward end of said second elongated shaft, said second elongated helical blade extending radially outwardly from said second elongated shaft to terminate outwardly in a second elongated outer blade edge, said outer blade edge of said second elongated helical blade curving in a second direction of rotation around said second elongated shaft as said second elongated helical blade extends rearwardly from said first end thereof toward said second end thereof to curve in such direction of rotation less than one full rotation around said second elongated shaft to thereupon terminate at said opposite second end of said second elongated helical blade, said second direction of rotation of said second elongated outer

blade edge of said second elongated helical blade around said second elongated shaft being opposite from said first direction of rotation of said first elongated outer blade edge of said first elongated helical blade around said first elongated shaft.

7. A propeller mechanism as set forth in claim 6, wherein said first and second elongated helical blades extend rearwardly from their respective first ends to their respective second ends a greater distance than said first and second elongated helical blades extend radially outwardly from their respective first and second elongated shafts to their respective first and second outer blade edges.

8. A propeller mechanism as set forth in claim 6, wherein said first and second propellers are mounted for rotation in side-by-side relationship and in opposite directions of rotation whereby each succeeding rearward portion of said first outer blade edge of said first elongated helical blade of said first propeller continually faces a corresponding portion of said second outer blade edge of said second elongated helical blade of said second propeller as each propeller is rotated in said opposite directions of rotation.

9. A propeller mechanism as set forth in claim 8, including drive means for rotating said first and second propellers in said opposite directions of rotation.

10. A propeller as set forth in claim 2 in combination with a boat having a hull, a first longitudinal portion of said hull being in contact with the water in a body of water when under way therein, said first longitudinal portion of said hull having a longitudinal dimension, said elongated shaft and said first elongated helical blade of said propeller having a longitudinal dimension corresponding to that of said first longitudinal hull portion, said propeller being mounted for rotation on said boat adjacent said first longitudinal hull portion, said boat including rotation means for rotation of said propeller.

11. A propeller mechanism as set forth in claim 7 in combination with a boat having a hull, a first longitudinal portion of said hull being in contact with the water in a body of water when under way therein, said propeller mechanism being mounted for rotation on said boat adjacent said first longitudinal portion of said hull in contact with the said water in said body of water when under way therein, said boat including rotation means for rotation of said propellers of said propeller mechanism in opposite directions of rotation whereby each succeeding rearward portion of said first outer blade edge of said first elongated helical blade of said first propeller continually faces a corresponding portion of said second outer blade edge of said second elongated helical blade of said second

propeller as each propeller is rotated in said opposite directions of rotation.

12. A propeller mechanism and boat as set forth in claim 11, including a second propeller mechanism as set forth in claim 11, said first longitudinal portion of said hull in contact with said water when under way having a port side and an opposite starboard side, said first mentioned propeller mechanism being mounted for rotation on said port side, said second propeller mechanism being mounted on said starboard side.

13. A propeller mechanism and boat as set forth in claim 11, including a second propeller mechanism as set forth in claim 11, said second propeller mechanism being mounted for rotation on said boat along said first longitudinal portion of said hull in contact with said water and in front of said first mentioned propeller mechanism.

14. A propeller mechanism as set forth in claim 7, including an elongated tubular housing having a tubular cavity to receive said propeller mechanism therein, said propeller mechanism being received therein and mounted for rotation therein, said tubular housing having a water inlet opening in front, a water discharge opening in back, said peripheral side wall closely adjacent each opposite side and the top of said propeller mechanism, said tubular housing having a longitudinal opening along the bottom of said propeller mechanism for discharge of water therethrough when

said propellers are rotated to draw water into said tubular housing through said inlet opening at the front, downwardly through said longitudinal opening along the bottom and outwardly of said tubular housing through said water discharge opening at the back of said tubular housing.

15. A propeller mechanism as set forth in claim 14, including a door in said tubular housing positioned to open, partially close and fully close said longitudinal opening along the bottom thereof.

16. A propeller mechanism as set forth in claim 7 in combination with a boat, said propeller mechanism being mounted for rotation forward of the bow of said boat and for operational contact with the water of a body of water in which said boat is under way to dissipate wave action in the area forward of the bow of said boat, including a support mechanism to support said propeller mechanism in said position forward of said bow of said boat, and a rotational drive mechanism to rotate said propellers in said propeller mechanism when so positioned.

17. A propeller as set forth in claim 1, including a second elongated blade affixed to said elongated shaft arcuately spaced apart from said first elongated blade, said second elongated blade having a first end closest to said forward end of said elongated shaft and an opposite second end closest to said rearward end of said elongated shaft, said second elongated blade extending outwardly from said

elongated shaft to terminate outwardly in an elongated outer blade edge, said outer blade edge of said second elongated blade curving in one direction of rotation around said elongated shaft as said second elongated blade extends rearwardly from said first end thereof toward said second end thereof to curve in such direction of rotation less than one full rotation to thereupon terminate at said opposite second end of said second elongated blade.

18. A propeller as set forth in claim 2, including a second elongated helical blade affixed to said elongated shaft spaced apart arcuately from said first elongated helical blade, said second elongated helical blade having an elongated outer blade edge radially spaced apart from said elongated shaft, a first blade end of said second elongated helical blade extending outwardly from said elongated shaft in one direction along a first blade edge thereof to terminate at said outer blade edge at one end of said outer blade edge and a spaced apart second blade end of said second elongated helical blade extending outwardly from said elongated shaft to terminate at said outer blade edge at the opposite end thereof, said second elongated helical blade extending along said elongated shaft on a helical path in a first direction of rotation around said elongated shaft from said first blade end to said second blade end, such rotation being less than one full rotation around said elongated shaft, said elongated shaft and said second elongated

helical blade having a longitudinal dimension greater than the dimension between said elongated shaft and said outer blade edge of said second elongated helical blade radially spaced apart from said elongated shaft.

19. A propeller as set forth in claim 1, wherein said elongated shaft is metal and said blade of said propeller includes a rigid rubber-like material that will float in water.

20. A propeller as set forth in claim 18, wherein said elongated shaft is a rigid non-metallic material and said blades of said propeller include a relatively rigid plastic material.

21. A propeller as set forth in claim 1, including a water vessel having a hull, an elongated housing to receive said propeller, said housing having a bottom wall, a longitudinal opening along said bottom wall for propulsion of water downwardly through said longitudinal opening when said propeller is rotated, and spaced apart support means mounted below said longitudinal opening for preventing contact of said propeller with an object therebelow.

22. A propeller mechanism and water vessel as set forth in claim 6, including an elongated housing to receive said propeller mechanism, said housing having a bottom wall, a longitudinal opening along said bottom wall for propulsion of water downwardly through said longitudinal opening when said propellers are rotated, and spaced apart support means

mounted below said longitudinal opening for preventing contact of said propellers with an object therebelow.

23. A propeller mechanism and water vessel as set forth in claim 22, wherein said spaced apart support means includes a first longitudinally extending support member and a second longitudinally extending support member spaced apart laterally from said first longitudinally extending support member for propulsion of water downwardly therebetween.

24. A propeller mechanism and water vessel as set forth in claim 6, including an elongated housing to receive said propeller mechanism, said housing having a front wall, an intake opening in said front wall for propulsion of water inwardly through said intake opening when said propellers are rotated, and spaced apart contact prevention means mounted in front of said intake opening for preventing contact of said propellers with an object at said intake opening in said front wall.

25. A propeller mechanism and water vessel as set forth in claim 6, including an elongated housing to receive said propeller mechanism, said housing having a rear wall, a discharge opening in said rear wall for propulsion of water outwardly through said discharge opening when said propellers are rotated, and spaced apart contact prevention means mounted over said discharge opening for preventing

contact of said propellers with an object at said discharge opening in said rear wall.

26. A propeller having an elongated longitudinal axis, a first elongated blade having a first end and an opposite second end, said first elongated blade extending outwardly from said longitudinal axis to terminate outwardly in an elongated outer blade edge, said outer blade edge of said first elongated blade curving in a helical path in one direction of rotation around said longitudinal axis as said first elongated blade extends rearwardly from said first end thereof toward said second end thereof, said outer blade edge of said first elongated blade curving in such direction of rotation less than one full rotation to thereupon terminate at said opposite second end of said first elongated blade, said outer blade edge being radially spaced apart from said longitudinal axis substantially the same distance from said first end of said first elongated blade to said second end of said first elongated blade.

27. A propeller having an elongated longitudinal axis of greater dimension than its radius of rotation, a first elongated helical blade extending along said longitudinal axis, said first elongated helical blade having an elongated outer blade edge radially spaced apart from said elongated longitudinal axis, a first blade end of said first elongated helical blade extending outwardly from said elongated

longitudinal axis in one direction along a first blade edge thereof to terminate at said outer blade edge at one end of said first elongated helical blade, and a spaced apart second blade end of said first elongated helical blade extending outwardly from said elongated longitudinal axis to terminate at said outer blade edge at the opposite end of said first elongated helical blade, said first elongated helical blade extending along said elongated longitudinal axis on a helical path in a first direction of rotation around said elongated shaft from said first blade end to said second blade end, such rotation being less than one full rotation around said elongated longitudinal axis, the longitudinal dimension of said first elongated helical blade being greater than the dimension between said elongated longitudinal axis and said outer blade edge of said first elongated helical blade radially spaced apart from said elongated longitudinal axis, said outer blade edge being radially spaced apart from said elongated longitudinal axis substantially the same distance from said first blade end to said second blade end.

28. A propeller mechanism having a first propeller having a first longitudinal axis, a first elongated helical blade extending along said first longitudinal axis, said first elongated helical blade having a first end and an opposite second end, said first elongated helical blade

extending radially outwardly from said first longitudinal axis to terminate outwardly in a first elongated outer blade edge, said first outer blade edge of said first elongated helical blade curving in a helical path in first direction of rotation around said first longitudinal axis as said first elongated helical blade extends rearwardly from said first end thereof toward said second end thereof to curve in such direction of rotation less than one full rotation around said first longitudinal axis to thereupon terminate at said opposite second end of said first elongated helical blade, a second propeller in side-by side relationship to said first propeller, said second propeller having a second longitudinal axis, a second elongated helical blade extending along said second longitudinal axis, said second elongated helical blade having a first end and an opposite second end, said second elongated helical blade extending radially outwardly from said second longitudinal axis to terminate outwardly in a second elongated outer blade edge, said outer blade edge of said second elongated helical blade curving in a helical path in a second direction of rotation around said second longitudinal axis as said second elongated helical blade extends rearwardly from said first end thereof toward said second end thereof to curve in such direction of rotation less than one full rotation around said second longitudinal axis to thereupon terminate at said opposite second end of said second elongated helical blade,

said second direction of rotation of said second elongated outer blade edge of said second elongated helical blade around said second longitudinal axis being opposite from said first direction of rotation of said first elongated outer blade edge of said first elongated helical blade around said first longitudinal axis.

29. A propeller mechanism as set forth in claim 28, wherein said first and second elongated helical blades extend rearwardly from their respective first ends to their respective second ends a greater distance than said first and second elongated helical blades extend radially outwardly from their respective first and second longitudinal axes to their respective first and second outer blade edges.

30. A propeller mechanism as set forth in claim 28, wherein said first and second propellers are mounted for rotation in side-by-side relationship and in opposite directions of rotation whereby each succeeding rearward portion of said first outer blade edge of said first elongated helical blade of said first propeller continually faces a corresponding portion of said second outer blade edge of said second elongated helical blade of said second propeller as each propeller is rotated in said opposite directions of rotation.

31. A propeller as set forth in claim 26 in combination with a boat having a hull, a first longitudinal portion of

said hull being in contact with the water in a body of water when under way therein, said first longitudinal portion of said hull having a first longitudinal dimension, said first elongated helical blade of said propeller having a longitudinal dimension corresponding to that of said first longitudinal hull portion, said propeller being mounted for rotation on said boat adjacent said first longitudinal hull portion, said boat including rotation means for rotation of said propeller.

32. A propeller mechanism as set forth in claim 28 in combination with a boat having a hull, a first longitudinal portion of said hull being in contact with the water in a body of water when under way therein, said propeller mechanism being mounted for rotation on said boat adjacent said first longitudinal portion of said hull in contact with the said water in said body of water when under way therein, said boat including rotation means for rotation of said propellers of said propeller mechanism in opposite directions of rotation whereby each succeeding rearward portion of said first outer blade edge of said first elongated helical blade of said first propeller continually faces a corresponding portion of said second outer blade edge of said second helical blade of said second propeller.

33. An elongated helical blade propeller in combination with a boat having a hull, a housing extending longitudinally along the bottom of said hull, said elongated

blade propeller being mounted for rotation in said housing, said housing having a bottom wall facing downwardly, a longitudinal opening in said bottom wall of said housing for flow of water downwardly there through when said propeller is rotated, and spaced apart support members secured below said longitudinal opening to protect said propeller from contact by an object that might otherwise interfere with rotation of said propeller.

34. An elongated helical blade propeller in combination with a boat having a hull as set forth in claim 33, wherein said housing includes a forward end, an intake opening at said forward end, spaced apart protective members secured over said intake opening to protect said propeller in said housing from contact by an object that might otherwise interfere with rotation of said propeller.

35. An elongated helical blade propeller in combination with a boat having a hull as set forth in claim 33, wherein said housing includes a rearward end, a discharge opening at said rearward end, spaced apart protective members secured over said discharge opening to protect said propeller in said housing from contact by an object that might otherwise interfere with rotation of said propeller.

36. An elongated helical blade propeller having a longitudinal axis, a first elongated blade having an inner blade edge adjacent said longitudinal axis, an outer blade edge spaced apart outwardly from said inner blade edge, a

forward blade end and an opposite rearward blade end spaced apart rearwardly from said forward blade end, the distance between said forward blade end and said rearward blade end of said first elongated blade being greater than the distance between said inner blade edge and said outer blade edge, said first elongated blade extending along said longitudinal axis from said forward blade end toward said rearward blade end in a helical path in one direction of rotation around said longitudinal axis, said outer blade edge being radially spaced apart from said longitudinal axis substantially the same distance from said forward blade end to said rearward blade end.

37. An elongated helical blade propeller as set forth in claim 36, including a second elongated blade having an inner blade edge of said second blade adjacent said longitudinal axis, an outer blade edge of said second blade spaced apart outwardly from said inner blade edge of said second blade, a forward blade end of said second blade and an opposite rearward blade end of said second blade spaced apart rearwardly from said forward blade end of said second blade, the distance between said forward blade end of said second blade and said rearward blade end of said second blade being greater than the distance between said inner blade edge of said second blade and said outer blade edge of

said second blade, said second elongated blade extending along said longitudinal axis from said forward blade end thereof toward said rearward blade end thereof in a helical path in one direction of rotation around said longitudinal axis, said second elongated blade being arcuately spaced apart from said first elongated blade, said outer blade edge of said second blade being radially spaced apart from said longitudinal axis substantially the same distance from said forward blade end of said second blade to said rearward blade end of said second blade.

38. An elongated helical blade propeller as set forth in claim 36, including a plurality of elongated blades each having an inner blade edge adjacent said longitudinal axis, an outer blade edge spaced apart outwardly from said inner blade edge, a forward blade end and an opposite rearward blade end spaced apart rearwardly from said forward blade end, the distance between said forward blade end of each of said plurality of blades and said rearward blade end of each of said plurality of blades being greater than the distance between said inner blade edge and said outer blade edge of each of said plurality of blades, each of said plurality of blades extending along said longitudinal axis from said forward blade end of respective ones thereof toward said rearward blade end of respective ones thereof in a helical

path in one direction of rotation around said longitudinal axis, each of said plurality of blades being arcuately spaced apart from adjacent ones thereof, said outer blade edge of each of said plurality of blades being radially spaced apart from said longitudinal axis substantially the same distance from said forward blade end of each of said blades to said rearward blade end of each of said blades respectively.

39. An elongated helical blade propeller as set forth in claim 38, wherein each of said blades extend in said helical path in one direction of rotation and for less than one full rotation around said longitudinal axis.

40. An elongated helical blade propeller mechanism including a propeller having a longitudinal axis, a first elongated blade having an inner blade edge adjacent said longitudinal axis, an outer blade edge spaced apart outwardly from said inner blade edge, a forward blade end and an opposite rearward blade end spaced apart rearwardly from said forward blade end, the distance between said forward blade end and said rearward blade end of said first elongated blade being greater than the distance between said inner blade edge and said outer blade edge, said first elongated blade extending along said longitudinal axis from

said forward blade end toward said rearward blade end in a helical path in one direction of rotation around said longitudinal axis, said outer blade edge being radially spaced apart from said longitudinal axis substantially the same distance from said forward blade end to said rearward blade end, a housing to receive said first propeller, a second propeller received in said housing in side-by-side relationship with said first propeller, said second propeller including a second longitudinal axis, a second plurality of elongated blades each having an inner blade edge adjacent said second longitudinal axis, an outer blade edge spaced apart outwardly from said inner blade edge, a forward blade end and an opposite rearward blade end spaced apart rearwardly from said forward blade end, the distance between said forward blade end of each of said second plurality of blades and said rearward blade end of each of said second plurality of blades being greater than the distance between said inner blade edge of each of said second plurality of blades and said outer blade edge of each of said second plurality of blades, each of said second plurality of blades extending along said second longitudinal axis from said forward blade end of respective ones thereof toward said rearward blade end of respective ones thereof in a helical path for less than one full turn in a second direction of rotation around said second longitudinal axis

which is opposite from said first direction of rotation of said first propeller around said longitudinal axis of said first propeller, each of said second plurality of blades being arcuately spaced apart from adjacent ones thereof.

41. A propeller mechanism to lift and free a water vehicle from a grounded position on the bottom of a body of water, including an elongated housing having a through passageway positioned longitudinally along the bottom of said water vehicle, said housing having a downwardly facing bottom wall, a longitudinal opening along said downwardly facing bottom wall, a water propelling mechanism in said elongated housing to flow water into said housing and downwardly through said longitudinal opening when said water propelling mechanism is operated, including spaced apart support members mounted below said housing and said longitudinal opening to support said water propelling mechanism above and out of contact with the ground and other objects that could otherwise interfere with operation of said water propelling mechanism.

42. A propulsion assembly and a water vessel having a longitudinal axis, a forward portion and a rearward portion, said propulsion assembly comprising a first forward propulsion mechanism having a longitudinal axis mounted below said forward portion of said water vessel, said first forward propulsion mechanism being pivotable between a position wherein the said longitudinal axis of said first

forward propulsion mechanism extends in the same direction as said longitudinal axis of said water vessel and a position wherein said longitudinal axis of said first forward propulsion mechanism extends at an obtuse angle toward one side of said longitudinal axis of said water vessel, a second forward propulsion mechanism having a longitudinal axis mounted below said rearward portion of said water vessel, said second forward propulsion mechanism being pivotable between a position wherein the said longitudinal axis of said second forward propulsion mechanism extends in the same direction as said longitudinal axis of said water vessel and a position wherein said longitudinal axis of said second forward propulsion mechanism extends at an obtuse angle toward the opposite side of said longitudinal axis of said water vessel, to more rapidly turn said water vessel from one forward direction to another when said first and second forward propulsion mechanisms are positioned at said respective obtuse angles to said longitudinal axis of said water vessel.

43. A propulsion assembly and a water vessel having a longitudinal axis, a forward portion and a rearward portion as set forth in claim 42, wherein one of said first and second forward propulsion mechanisms includes an elongated propeller.

44. A propulsion assembly and a water vessel having a longitudinal axis, a forward portion and a rearward portion

as set forth in claim 42, wherein one of said first and second forward propulsion mechanisms includes an elongated helical blade propeller.

45. A propulsion assembly and a water vessel having a longitudinal axis, a forward end, a rearward end, and a bottom portion, mounting means for mounting a plurality of screw propellers for rotation in longitudinally spaced apart relationship along said bottom portion of said water vessel from said forward end thereof toward said rearward end thereof, at least a portion of one of said plurality of screw propellers reaching said forward end of said water vessel, at least a portion of a different one of said plurality of screw propellers reaching said rearward end of said water vessel.

Respectfully submitted,


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